Integrating Sustainable Agriculture into SCS Conservation Programs

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Conservation programs require large volumes of information. These programs work with people who make decisions about managing natural resources based on information they have and understand. If that information is incomplete or erroneous, decisions will be faulty. If the information is complete and accurate, decisions are less likely to be faulty. Although this sounds simple, placing good, technically and biologically sound resource information in the hands of decision-makers requires careful planning and coordination among many specialists.

Sustainable agriculture presents a challenge to conservation programs. This chapter describes some goals of sustainable agriculture, and some ways the Soil Conservation Service (SCS) system delivers new technologies to help implement sustainable agricultural farming methods.

Although there is no strict definition of sustainable agriculture because of ongoing debate concerning agriculture and the environment, there is a growing consensus about its goals. Sustainable agriculture must be made up of farming and ranching systems that can maintain productivity and protect the environment indefinitely. Sustainable systems must be resource conserving, socially supportive, commercially competitive, and environmentally sound. A sustainable agriculture reduces adverse effects to on-site and off-site environments, while providing a sustained level of production and profit. Sustainable agriculture should be considered a goal, not a practice. Sound resource conservation is an integral part of sustainable agricultural systems.

Good Information To Support Good Decisions

SCS uses many avenues to provide natural resource information and management technology to its field personnel. These methods include specific handbooks, manuals, and the SCS *Field Office Technical Guide*. This guide is used by the SCS field office staffs as the general reference document for technical assistance. SCS technical specialists modify each *Field Office Technical Guide* to accurately address local cultural and natural resource conditions.

Each *Field Office Technical Guide* has five sections:

1. General Resource References
2. Soil and Site Information
3. Conservation Management Systems
4. Practice Standards and Specifications
5. Conservation Effects

The goal of SCS conservation programs is to provide planning assistance to decisionmakers. This assistance enables these decisionmakers to implement systems of conservation practices and management that protect natural resources. The systems prevent degradation and permit sustainable use. In 1991, SCS is revising procedures and criteria to offer sound planning alternatives by placing criteria for conservation treatment of soil, water, plant, animal, and air resources in each *Field Office Technical Guide*. These criteria will allow SCS to measure attainment of nondegradation goals and other acceptable levels of treatment.

In a Maryland cornfield at the mouth of the Patuxent River, Janine Baratta (left) and Mitch Woodward (right), University of Maryland nutrient management specialists, apply various rates of nitrogen fertilizer to determine the best rate that avoids overfertilization.
Charles Phillips/USDA 90BW1112-21

Section four of the guide contains standards and specifications for more than 100 conservation practices. These are the building blocks of conservation management systems and form the basis for creating sustainable systems. Practice standards set forth the minimum level of acceptable quality for planning, designing, installing, operating, and maintaining each practice. Practice specifications state technical details and workmanship necessary to install the practice properly. As new technologies are discovered or developed, they are incorporated into this section of the guide.

SCS field personnel and technical specialists record expected and observed effects of conservation practices in section 5 of the *Field Office Technical Guide*. Landowners and land managers are shown these effects to allow them to assess the impacts of conservation alternatives. This will improve the ability of farmers and ranchers to understand the probable effects of their management options and to make better, more informed decisions.

Sustainable Technologies

Within the philosophical framework of sustainable agriculture, the type of agriculture that emerges is not low-input or "low-technology." It is an agriculture that allows for the integration of several sophisticated technologies to produce a more efficient and environmentally responsible agriculture. For example, technologies such as genetic engineering, remote sensing, and field-level chemical testing all play a role in improving sustainability. Plants bred for increased photosynthetic efficiency, improved nutrient efficiency, nitrogen fixation, and improved pest resistance provide producers with opportunities to decrease expenditures for fertilizers and pesticides. Remote sensing of pest populations also will aid in improving pest management. Tissue testing in the field will allow more efficient fertilizer application with less likelihood for pollution of surface or ground waters.

Some older technologies also apply to sustainable agriculture. These older technologies include practices and systems that have proved useful in managing soil erosion, water movement, and pest management. Practices which break steep slopes into less steep and less erosive surfaces (such as constructed terraces, diversions, hillside ditches, and vegetative bench terraces) are important. Conservation tillage practices such as minimum tillage, ridge tillage, and no-till offer options to producers to manage their lands more efficiently with less adverse environmental impact. Crop rotation, contour cultivation, strip cropping, windbreaks, and windstrips are also basic management tools that contribute to agricultural sustainability.

Sustainable agriculture, in practice, must be considered as a system—a system that addresses unique environmental, economic, and social needs and conditions, and a system that exists in a larger context of varying local, national, and even international conditions. These systems must not be defined only by the innovative practices and methods they include, or by any "low-input" facets to their operation. Instead, they are defined by the balanced, systematic integration of technologies, management strategies, and methods which have been selected to meet the environmental, economic, and social criteria of sustainability. Agricultural options will complement each other and interact with existing systems on adjoining management units.

Within SCS conservation programs, sustainable agriculture is an idea that works. Resource-conserving, farm planning assistance is provided based on local social, economic, and natural resource conditions. Sustainable agriculture calls for more grassroots information sharing and resource concern.

Near Weslaco, TX, entomologist Don Hendricks (right) and Technician Carlos Perez test infrared sensors used to count flying insects lured into this wire mesh cone by a sex pheromone. A high signal count indicates that insect populations may be threatening crops.
Tim McCabe/USDA 0387X0162-19

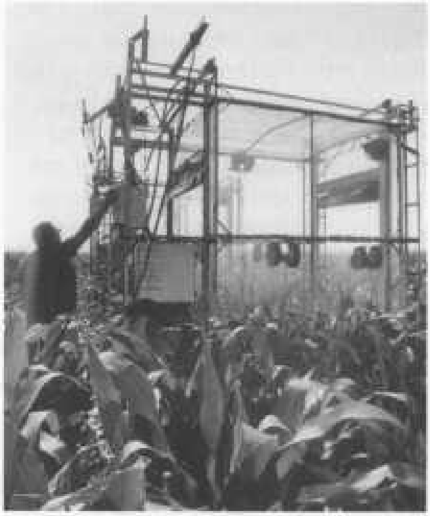
Planning a Sustainable Agriculture

Through its conservation programs, SCS is integrating the following principles of sustainable agriculture into the planning process:

- First, conservation planners must think in terms of natural resources as an ecosystem. They must place the agricultural ecosystem into its economic and sociologic context as well. Planners look carefully at each resource condition and consider how it relates to the management unit as a whole. Planners also must consider how management options will complement each other and interact with existing systems on adjoining management units.

- Second, conservation program planners actively involve the producer at all steps of the planning process. Development of effective management systems requires participation by and consideration of people throughout the planning process. Effective planners recognize that the producer has knowledge, skills, and abilities that are complementary to those of the planner.
- Third, effective application of sustainable agricultural systems requires that the planner look beyond resource problems. While examining the whole operation, planners will be alert to potential resource uses that may exist on the land.
- Fourth, planners must think in terms of resource efficiency. Effective planning for sustainable agriculture seeks to use locally available resources as production inputs and reduce use of external or remote resources. This promotes reduced input costs and improved efficiency of resource use.
- Last, planners and producers must consider both on-site and off-site effects of conservation management systems, in order to reduce adverse effects to the environment.

It is important for the planning tools to be up-to-date and accurate. The *Field Office Technical Guide,* along with specific handbooks and manuals, forms the foundation for planners who are building sustainability into conservation programs. ■



A technician throws a switch on a mobile field chamber capable of measuring the rate of photosynthesis in experimental corn plots.
Tim McCabe/USDA 0687X0697-20